Contact Information
Oil or Chemical Spill

call the National Response Center at

800-424-8802

Oil Spill Planning

in the Coastal Zone of California, contact the local U.S. Coast Guard Marine Safety Office (MSO):

MSO San Francisco Bay
510-437-3073

MSO Los Angeles/Long Beach
562-980-4444

MSO San Diego
619-683-6470

For RRT assistance in the Inland Zones of California, Arizona or Nevada, contact the Region IX office of the U.S. Environmental Protection Agency:
415-744-2332

Region IX
Regional Response Team Website:

http://www.uscg.mil/pacarea/pm/rrt/rrtmin.htm

Document prepared by:
Regions I & IX Mainland
Regional Response Teams

RRT-IX Co-chairs:
U.S. Coast Guard 510-437-2940
U.S. EPA 415-744-1730

Suggested References:

Oil in the Sea
National Academy Press 1985

Mechanical Protection Guidelines
NOAA/HAZMAT and
U.S. Coast Guard 1994

Response to Marine Oil Spills
The International Tanker Owners Pollution Federation, Ltd. 1986

EPA's Oil Program Website
www.epa.gov/oilspill/

Coast Guard's Marine Safety and Environmental Protection Website
www.uscg.mil/hq/g-m/

NOAA HAZMAT Website
response.restoration.noaa.gov

Oil Spill Intelligence Report's Oil Spill Basics: A Primer for Students
www.cutter.com/osir/primer.htm

MECHANICAL CONTAINMENT AND RECOVERY OF SPILLED OIL

Aerial view of the Cape Mohican oil spill in San Francisco Bay.

Photo: CA DFG/OSPR

August 1998

General Spill Response Considerations

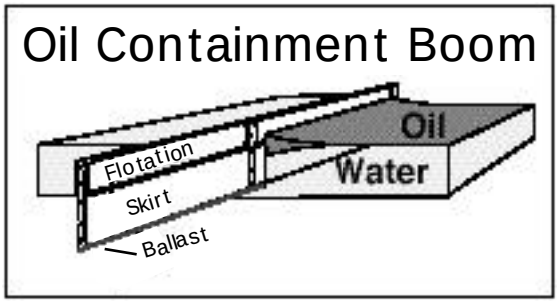
When prevention efforts fail and an oil spill occurs on the water, spill responders face a difficult battle against a dynamic and ever-changing opponent. They have a number of tools at their disposal, depending on the unique aspects of each situation. Among the options available are mechanical cleanup methods, such as containment booms and skimmers, non-mechanical methods, such as dispersants or *in-situ* burning, natural removal, and shoreline cleanup. The selected mix of countermeasures will depend on potential shoreline and natural resource impacts, the size, location, and type of oil spilled, weather, and other variables.

This pamphlet on mechanical spill response is one of a series that provides an overview of oil spill prevention, planning, and response.

What Is Mechanical Spill Response?

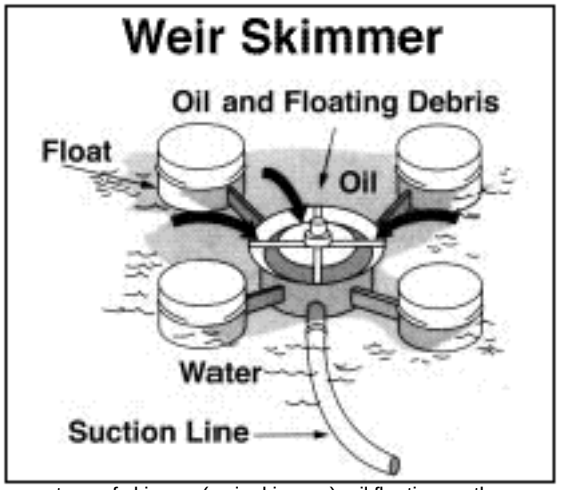
Mechanical oil spill response uses physical barriers and mechanical devices to redirect and remove oil from the surface of the water. Where feasible and effective, this technique is preferable to other methods, since spilled oil is removed from the environment to be recycled or disposed of at appropriate facilities. Because effective mechanical containment and removal is severely restricted by wind, waves, and currents, only a small percentage of spilled oil has historically been recovered. Mechanical removal of oil utilizes two types of equipment: booms and skimmers.

Oil Containment Booms: Spilled oil floating on the water's surface is affected by wind, currents, and gravity, all of which cause it to spread. This oil may be concentrated or redirected by deploying floating barriers, called booms. Booms come in many different shapes, sizes, and styles. They are used for concentrating oil so that it is thick enough to be skimmed, for keeping oil out of sensitive areas, or for diverting oil into collection areas. Just like the oil they are trying to corral, the success of booming as a strategy is dependent on currents, wind, and waves. Currents can draw the oil under the booms; waves may cause oil splashover; wind and currents may cause the booms to sink or plane; and debris may damage the boom.



Oil containment boom allows water to pass below the boom skirt while stopping the oil floating on the water.

Skimmers: These devices remove oil from the surface and are typically used with booms that concentrate the oil to make it thick enough to be skimmed efficiently. The effectiveness of the skimmer is determined by how quickly it can collect the oil, and how much water is mixed in with it. The oil collected by the skimmer is stored in a containment tank. A wide variety of skimmers is available that use different methods for separating oil from water. Skimmer operating time is limited by the size of the containment tank and skimmer effectiveness can be hampered by debris. Skimmers are used to remove oil from open water, while vacuum trucks are often used to remove oil that has collected near the shoreline.



In one type of skimmer(weir skimmer), oil floating on the surface of the water is pumped into storage after flowing over the skimmer's weir, which is maintained at the oil/water interface.

What Are the Potential Benefits?

- Physically removes oil from the environment.
- Allows recycling or proper disposal of recovered oil.
- Minimizes direct environmental impacts in open water areas.

What Are the Potential Tradeoffs?

- Limitations of mechanical recovery exist. Wind, waves and currents may allow only a fraction of the spilled oil to be contained and recovered.
- Over-reliance on mechanical strategies can be problematic. The limitations of mechanical protection and recovery methods must be fully considered. Booms may fail and skimmers may clog. Responders and response advisors must avoid one dimensional thinking and instead consider the net environmental benefits of all response actions taken.